

Please replace the paragraph beginning on page 19, line 10 with the following:

--3. Image convolution operations. For example, a blur filter matrix M is given by:

$$\begin{bmatrix} 1/16 & 1/8 & 1/16 \\ 1/8 & 1/4 & 1/8 \\ 1/16 & 1/8 & 1/16 \end{bmatrix}$$

BB The blur equation is for each color component. Assuming a RGB color component of a pixel at location (i, j) is C(i,j), the resulting RGB color component of the pixel after the blur operation is given by:

$$(1/16)C(i-1, j-1) + (1/8)C(i-1, j) + (1/16)C(i-1, j+1) +$$

$$(1/8)C(i, j-1) + (1/4)C(i, j) + (1/8)C(i, j+1) +$$

$$(1/16)C(i+1, j-1) + (1/8)C(i+1, j) + (1/16)C(i+1, j+1)--$$

# IN THE CLAIMS:

Please amend the following claims:

BU 1. (Amended) A method for providing a color space representation of color images in a color management system, comprising the steps of:

mapping color to color data values in one of a gamut expanded RGB color space and a gamut expanded RGBA color space, wherein said gamut expanded color space is a common color data interchange format; and

labeling an image determined by mapped color values as one of a gamut expanded RGB color space image and a gamut expanded RGBA color space image.

2. (Amended) The method of claim 1 wherein mapping includes, where colors from a selected color space are converted to one of the gamut expanded RGB color space and the

gamut expanded RGBA color space, mapping color data values of a source color space image to color data values of one of the gamut expanded RGB color space and the gamut expanded RGBA color space.

3. (Amended) The method of claim 1 wherein mapping includes, where colors in one of the gamut expanded RGB color space and the gamut expanded RGBA color space are converted to a selected color space, mapping color data values of one of the gamut expanded RGB color space and the gamut expanded RGBA color space to color data values of a destination color space.

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7. (Amended) The method of claim 3 wherein, where the color data values in one of the gamut expanded RGB color space and the gamut expanded RGBA color space lie outside a range of the destination color space, mapping includes clipping the color data values for the destination color space.

5. (Amended) The method of claim 3 wherein, where the color data values in one of the gamut expanded RGB color space and the gamut expanded RGBA color space lie outside the range of the destination color space, mapping includes utilizing a predetermined transformation function that maps the color data values to color data values in the selected destination color space.

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6. (Amended) The method of claim 1 wherein one of the gamut expanded RGB color space and the gamut expanded RGBA color space is linear in visual intensity.

7. (Amended) The method of claim 1 wherein one of the gamut expanded RGB color space and the gamut expanded RGBA color space is an XsRGB color space that includes at least the visible range of color values, and where selected, wherein one of the gamut expanded RGB color space and the gamut expanded RGBA color space includes an alpha channel for at least one of: transparency information and opaqueness information.

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con > 8. (Amended) The method of claim 1 wherein one of the gamut expanded RGB color space and the gamut expanded RGBA color space includes a color space defined by a gamut that extends into negative component values and beyond 1.0 when normalized to 1.0 in RGB.

9. (Amended) The method of claim 1 wherein mapping the color values to one of the gamut expanded RGB color space and the gamut expanded RGBA color space includes utilizing multiplication of  $R_0$ ,  $G_0$ ,  $B_0$  values by a predetermined matrix, where the  $R_0$ ,  $G_0$ , and  $B_0$  values denote normalized numerically linear red, green and blue components for a color value.

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De 15. (Amended) In a digitized image processing system in which an image digitizer outputs digital signals representing an image, a method for providing representation of color images from measured color values in a color management system, comprising the steps of:

25 mapping the measured color values to a gamut expanded color space, wherein the expanded color space includes color values beyond a reproduction range of a specific device and

includes all colors in a humanly visible gamut and further wherein said gamut expanded color space is a common color data interchange format; and

labeling an image determined by the color values mapped to the gamut expanded color space as a gamut expanded color space image.

16. (Amended) The method of claim 15 wherein the gamut expanded color space includes an XsRGB color space defined by a gamut that extends into negative component values and beyond 1.0 when normalized to 1.0 in RGB, and where selected, wherein the expanded RGB/RGBA space includes an alpha channel for at least one of: transparency information and opaqueness information.

23. (Amended) A computer-readable medium having computer-executable instructions for performing the steps of:

mapping the measured color values to a gamut expanded color space, wherein said gamut expanded color space is a common color data interchange format; and

labeling an image determined by the color values mapped to the gamut expanded color space as a gamut expanded color space image.

24. (Amended) In a digitized image processing system in which an image digitizer utilizes color image information to output digital signals representing a color image to an apparatus that uses the digital signals to provide representation of a color image in a color management system, the apparatus comprising:

an expanded color space mapper, for mapping the digital signals to a gamut expanded color space values, wherein the gamut expanded color space values include color values beyond a reproduction range of a specific device and includes all colors in a humanly visible gamut and further wherein said gamut expanded color space is a common color data interchange format; and

an image labeller, coupled to the gamut expanded color space mapper, for labeling an image determined by gamut expanded color space values as a gamut expanded color space image.

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25. (Amended) The apparatus of claim 24 wherein the gamut expanded color space includes an XsRGB color space defined by a gamut that extends into negative component values and beyond 1.0 when normalized to 1.0 in RGB, and where selected, wherein one of the gamut expanded RGB color space and the gamut expanded RGBA color space includes an alpha channel for at least one of: transparency information and opaqueness information.

26. (Amended) The apparatus of claim 24 wherein the gamut expanded color space mapper utilizes multiplication of  $R_0$ ,  $G_0$ ,  $B_0$  values by a predetermined matrix to map the color values to a gamut expanded color space.

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30. (Amended) The apparatus of claim 24 wherein, where color data values have been represented using signed 16 bit values with 13 bits of decimal precision, the gamut expanded color space mapper clips the 16 bit values below 0 and above 8192 to convert the 16 bit values to 8 bit values.

32. (Amended) A computer-readable medium having computer-executable instructions for performing steps comprising:

mapping color values, in a color management system, to one of a gamut expanded RGB color space and a gamut expanded RGBA color space, wherein said gamut expanded color space is a common color data interchange format; and

labeling an image determined by mapped color values as one of a gamut expanded RGB color space and a gamut expanded RGBA color space image.

28 33. (Amended) The computer-readable medium of claim 32 wherein one of the gamut expanded RGB color space and the gamut expanded RGBA color space includes an XsRGB color space that includes at least the visible range of color values, and where selected, wherein one of the gamut expanded RGB color space and the gamut expanded RGBA color space includes an alpha channel for at least one of: transparency information and opaqueness information.

34. (Amended) The computer-readable medium of claim 32 wherein one of the gamut expanded RGB color space and the gamut expanded RGBA color space includes a color space defined by a gamut that extends into negative component values and beyond 1.0 when normalized to 1.0 in RGB.

35. (Amended) The computer-readable medium of claim 32 wherein mapping the color values to one of the gamut expanded RGB color space and the gamut expanded RGBA color space includes utilizing multiplication of  $R_0, G_0, B_0$  values by a predetermined matrix.

41. (Amended) The computer-readable medium of claim 32 wherein one of the gamut expanded RGB color space and the gamut expanded RGBA color space includes an alpha channel for at least one of transparency information and opaqueness information.

42. (Amended) A method of representation of color in images in a color management system using color data values for one of a gamut expanded RGB color space and a gamut expanded RGBA color space, having at least a precision and range sufficient to represent substantially all humanly visible colors substantially without visually perceptible error, the method including the steps of:

representing the color as data values in one of the gamut expanded RGB color space and the gamut expanded RGBA color space, wherein said gamut expanded color space is a common color data interchange format; and

labeling an image determined by the color data values as one of a gamut expanded RGB color space image and a gamut expanded RGBA color space image.

43. (Amended) The method of claim 42 wherein representing includes, where color data values from a selected color space are converted to one of the gamut expanded RGB color space and the gamut expanded RGBA color space, mapping the color data values of a

selected image color space to color data values of one of the gamut expanded RGB color space and the gamut expanded RGBA color space.

44. (Amended) The method of claim 42 wherein representing includes, where color data values in one of the expanded RGB color space and the gamut expanded RGBA color space are converted to a selected color space, mapping the color data values of one of the gamut expanded RGB color space and the gamut expanded RGBA color space to a selected destination color space.

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45. (Amended) The method of claim 44 wherein, where the perceptually visible data values lie outside a predetermined range, the mapping includes clipping the color data values to a range of the selected destination color space.

46. (Amended) The method of claim 44 wherein the mapping includes utilizing a predetermined transformation function that maps the color data values to color data values in the selected destination color space.

47. (Amended) The method of claim 42 wherein one of the gamut expanded RGB color space and the gamut expanded RGBA color space is linear in visual intensity.

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48. (Amended) A method for representing color images in a color management system in one of a gamut expanded RGB color space and a gamut expanded RGBA color space



and further representing at least one of super transparent and super opaque colors using an alpha channel, comprising the steps of:

representing color data values as perceptually visible super transparent/super opaque data values in a color space, wherein said gamut expanded color space is a common color data interchange format; and

labeling an image determined by the perceptually visible super transparent/super opaque data values as a super transparent/super opaque color space image.

49. (Amended) The method of claim 1 wherein color operations defined in one of the gamut expanded RGB color space and the gamut expanded RGBA color space are extended to one of the gamut expanded RGB color space and the gamut expanded RGBA color space.

50. (Amended) The method of claim 48 wherein the alpha channel extends less than 0 and beyond 1.0 when normalized to 1.0.

51. (Amended) A method of representing gamut expanded color data values in images in a color management system using color data as appearance RGB values, comprising the steps of:

representing the gamut expanded color data values as normalized RGB values wherein each normalized RGB value ( $R_w$ ,  $G_w$ ,  $B_w$ ) is obtained using a predetermined transformation matrix that is based on a preselected spectrum distribution wherein said gamut expanded color data values are a common color data interchange format; and

labeling a gamut expanded color space image determined by the normalized RGB values as an appearance match image for corresponding X, Y, and Z values in accordance with 1931 Commission Internationale de l'Eclairage where Y has been normalized to 1.

52. (Amended) A device for representing gamut expanded color data values in images in a color management system using color data as appearance RGB values, comprising:

an expanded color space mapper, arranged to represent the gamut expanded color data values as normalized RGB values wherein each normalized RGB value ( $R_w, G_w, B_w$ ) is obtained using a predetermined transformation matrix that is based on a preselected spectrum distribution, wherein said gamut expanded color data values are a common color data interchange format; and

an image labeller, for labeling a gamut expanded color space image determined by the normalized RGB values as an appearance match image for corresponding X, Y, and Z values in accordance with 1931 Commission Internationale de l'Eclairage where Y has been normalized to 1.

53. (Amended) A method of representing gamut expanded color data values in images using color data as absolute RGB values, comprising the steps of:

representing the gamut expanded color data values as absolute RGB values wherein each absolute RGB value  $(R_0, G_0, B_0)$  is obtained using a predetermined transformation matrix that is based on a standard 1931 Commission Internationale de l'Eclairage D65 spectrum distribution, wherein said gamut expanded color data values are a common color data interchange format; and

labeling a gamut expanded color space image determined by the absolute RGB values as an absolute match image for corresponding  $X$ ,  $Y$ , and  $Z$  values in accordance with 1931 Commission Internationale de l'Eclairage where  $Y$  has been normalized to 1.

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54. (Amended) A device for representing gamut expanded color data values in images using color data as absolute RGB values, comprising:

an color space mapper, arranged to represent the gamut expanded color data values as absolute RGB values wherein each absolute RGB value  $(R_0, G_0, B_0)$  is obtained using a predetermined transformation matrix that is based on a standard 1931 Commission Internationale de l'Eclairage D65 spectrum distribution, wherein said gamut expanded color data values are a common color data interchange format;

an image labeler for labeling a gamut expanded color space image determined by the absolute RGB values as an absolute match image for corresponding  $X$ ,  $Y$ , and  $Z$  values in accordance with 1931 Commission Internationale de l'Eclairage where  $Y$  has been normalized to 1.

Please add the following new claims:

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--55. (New) A method for providing a color space representation of color images in a color management system, comprising the steps of:

mapping color data from a source peripheral device to a gamut expanded color space, wherein said gamut expanded color space is a common color data interchange format; and converting said gamut expanded color space to a color space of a destination peripheral device.

56. (New) The method according to Claim 55, wherein the expanded color space includes color values beyond a reproduction range of a specific device and includes all colors in a humanly visible gamut.

57. (New) In a digitized image processing system in which an image digitizer utilizes color image information to output digital color signals representing a color image to an apparatus that uses the digital color signals to provide representation of a color image in a color management system, the apparatus comprising:

an expanded color space mapper, for mapping the digital color data signals of a source peripheral device to gamut expanded color space values, wherein the gamut expanded color space values comprise a common color data interchange format; and

a processor for converting said gamut expanded color space values to color space values for a color space of a destination peripheral device.

58. (New) A computer-readable medium having computer-executable instructions for performing steps comprising:

mapping color data from a source peripheral device to a gamut expanded color space, wherein said gamut expanded color space is a common color data interchange format; and

converting said gamut expanded color space to a color space of a destination peripheral device.

59. (New) A method of representation of color in images in a color management system using color data values for a gamut expanded color space, having at least a precision and range sufficient to represent substantially all humanly visible colors substantially without visually perceptible error, the method including the steps of:

representing color data from a source peripheral device in a gamut expanded color space, wherein said gamut expanded color space is a common color data interchange format; and

converting said gamut expanded color space to a color space of a destination peripheral device.

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60. (New) A method for representing color images in a color management system in a gamut expanded color space and further representing at least one of super transparent and super opaque colors using an alpha channel, comprising the steps of:

representing color data values as one of perceptually visible super transparent data values and perceptually visible super opaque data values in said gamut expanded color space, wherein the gamut expanded color space is a common color data interchange format; and

converting one of said perceptually visible super transparent data values and perceptually

~~visible super opaque data values to color data values of a destination peripheral device.~~